



JAWS S3 Panel I

Requirements Generation for Total Battlespace Awareness

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Challenges in a Changing Defense Environment



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- Fundamental Changes
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- Three Major Challenges
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- Adapting to Change, Meeting the Challenges



Fundamental Changes



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- Information Revolution
- Revolution in Military Affairs
- Dynamic Post-Cold War Strategic Environment
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- *How do we adapt?*
- *How do we stay ahead of the competition?*



Three Major Challenges



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- **How do we adapt to concurrently changing strategic environments, adversaries, missions, concepts, doctrine, organizations, systems, technologies?**
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- **How do we create products for the warfighter which are not obsolescent when fielded?**
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- **How do we balance the need for immediate, tailored, locally optimized solutions... against the desire for robust, enduring, globally capable solutions**
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Challenge #1: Adapting to Change



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Approach

■ Experimentation (near term)

- Purpose: Push the edge of the envelope to expand our knowledge and understanding of emerging technologies, systems, and concepts
- Encourage & reward exploration, innovation, risk taking
 - Expect, accept & learn from concept “failures”
- Determine key parameters & measures
 - Improve our qualitative & quantitative understanding
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■ Research (long term)

- Encourage research in adaptive systems: evolutionary programming, genetic algorithms, neural nets



Challenge #2: Avoiding Obsolescence



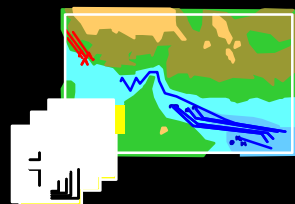
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Approach: Simulation Based Acquisition

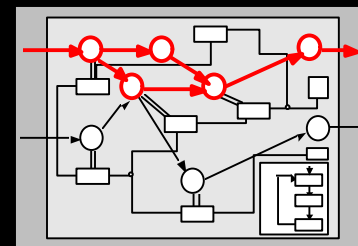
- Revamp acquisition process to capitalize on the advances, advantages & potential of digital information technology
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- Use shared access to distributed information to:
 - Facilitate iterative, spiral development
 - Facilitate collaborative, concurrent processes
 - Create synergy between requirements pull & technology push

Traditional Defense Acquisition Process

(Paper Based Process)

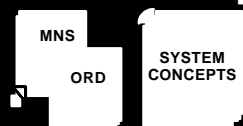


Conceptual Development

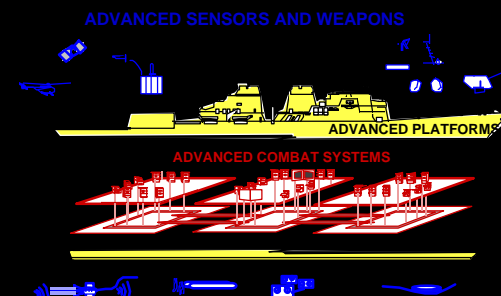


Functional Design

Top Level System Requirements



Physical & Info System (HW/SW) Design



Cost, Schedule & Program Mgmt



Operations, Logistics & Training

T&E

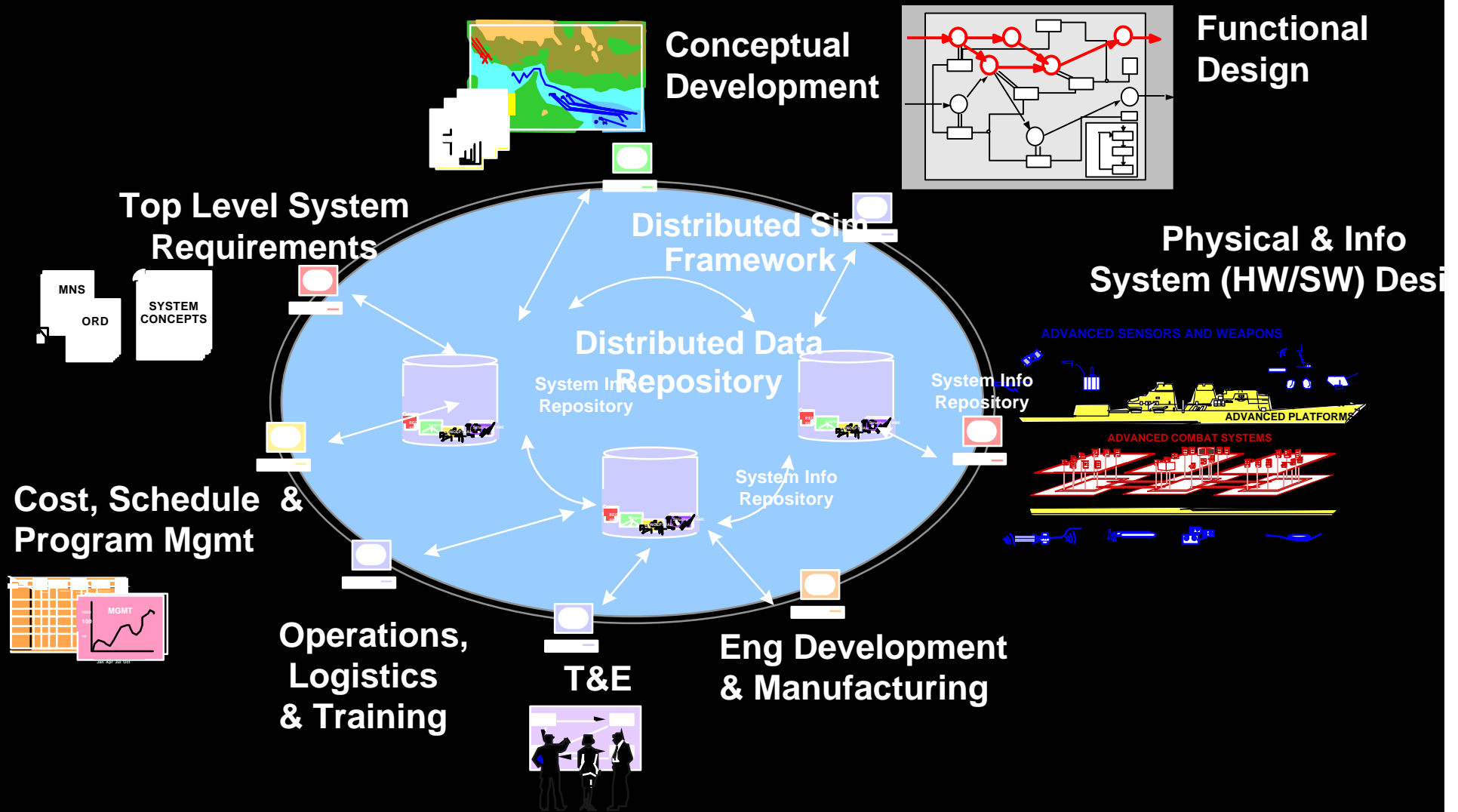


Eng Development & Manufacturing

Discrete Government & Industry Processes and Information Domains

SBA Operational Concept Illustration

(Digital Information Based Process)



Extensive Re-use Across Phases and Across Acquisition Programs

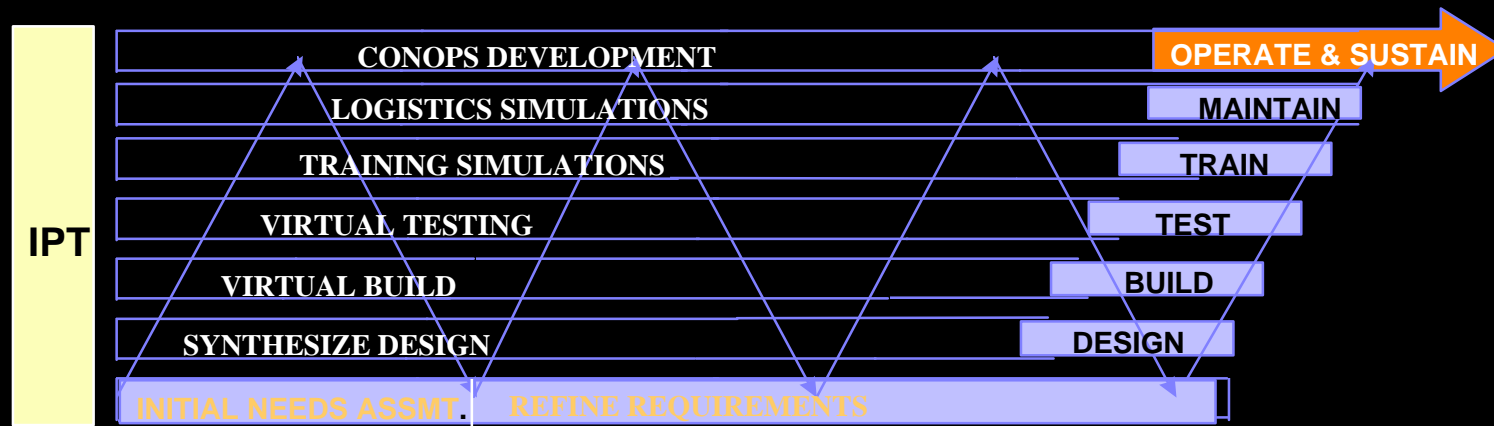
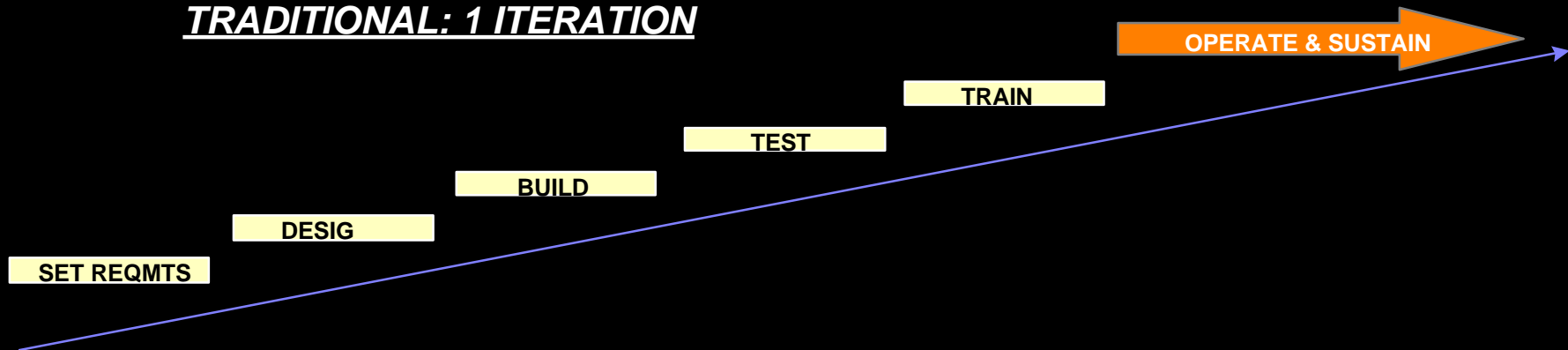


SBA: Enabling Integrated & Iterative Processes



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TRADITIONAL: 1 ITERATION



SBA: MULTIPLE ITERATIONS (MULTIPLE DESIGN LEARNING CYCLES)



Challenge #3: Local vs Global Solutions



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Approach

- **Develop & adhere to recognized architectures & standards**
- **Examples: JTA, DII-COE, HLA, JMASS, Database standards, etc**
- **Incentivize compliance**
- **Engage professional societies (eg, IEEE, AIAA) to encourage broad recognition & acceptance of architecture & standards**
- **Plan for growth: Service to Joint to Coalition, Government + NGO, Mil Spec to Commercial**



Summary



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- Highly dynamic defense environment, now and for the foreseeable future
- Three major challenges will not be easily solved
- Suggested approaches should help, but more will be needed
- Your ideas and support are solicited